

Claims

We claim:

1. A method for processing video source frames, comprising:

providing a video processing system (VPS) that includes a processor, a memory structure, and a video input device, wherein the processor is coupled to the memory structure and to the video input device;

inputting video source frames from a video source into the VPS through the video input device;

executing the video source frames, by the processor;

dynamically and non-contiguously extracting key frames from the video source frames during the executing, said extracting implemented in accordance with a frame extraction algorithm that is stored in the memory structure and executed by the processor;

storing the extracted key frames in a first memory of the memory structure; and

terminating extracting key frames, prior to completion of said executing of the video source frames.

2. The method of claim 1, wherein the first memory includes a temporary memory.

3. The method of claim 2, wherein the temporary memory includes a random access memory (RAM).

1 4. The method of claim 1, wherein the first memory includes a permanent memory.

1 5. The method of claim 4, wherein the permanent memory includes hard disk memory.

1 6. The method of claim 1, further comprising recording in the first memory an indication of a
2 video source frame being executed when the terminating occurred.

1 7. The method of claim 6, wherein recording in the first memory comprises generating a special
2 key frame that includes the indication, and further comprising appending the special key frame to
3 the extracted key frames in the first memory.

4 8. The method of claim 1, wherein the terminating is triggered by action of a user of the VPS.

5 9. The method of claim 8, wherein the action includes a manipulating by the user of a user input
6 device.

1 10. The method of claim 1, wherein the terminating occurs at a time when a predetermined
2 condition has occurred.

1 11. The method of claim 10, wherein the predetermined condition includes execution of a
2 predetermined fraction or percentage of the video source frames.

1 12. The method of claim 10, wherein the predetermined condition includes execution of a
2 predetermined number of video source frames.

1 13. The method of claim 10, wherein the predetermined condition includes an elapsing of
2 predetermined time duration from initiation of executing the video source frames.

1 14. The method of claim 1, further comprising reviewing the key frames by a user of the VPS,
2 wherein the reviewing occurs through an output display that is coupled to the processor.

1 15. The method of claim 14, wherein the output display includes a television screen or a
2 computer monitor.

1 16. The method of claim 14, wherein the reviewing occurs prior to completion of executing the
2 video source frames.

1 17. The method of claim 16, wherein the reviewing occurs at or after the terminating.

1 18. The method of claim 16, wherein the reviewing occurs prior to the terminating.

1 19. The method of claim 14, wherein the reviewing occurs at or after completion of executing
2 the video source frames.

1 20. The method of claim 14, further comprising at or after completion of the reviewing, erasing
2 the key frames from the first memory.

1 21. The method of claim 20, wherein the erasing is triggered by action of the user.

1 22. The method of claim 21, wherein the action includes a manipulating by the user of a user
2 input device.

1 23. The method of claim 20, wherein the erasing occurs at a time when a predetermined
2 condition has occurred.

1 24. The method of claim 23, wherein the predetermined condition includes completion of the
2 executing of the video source frames.

1 25. The method of claim 23, wherein the predetermined condition includes an elapse of a
2 predetermined amount of time following the reviewing.

1 26. The method of claim 14, further comprising after completion of the reviewing, copying the
2 key frames from the first memory to a second memory of the memory structure, wherein the
3 second memory includes a removable memory.

1 27. The method of claim 26, further comprising after completion of the copying, erasing the key

2 frames from the first memory.

1 28. The method of claim 1, wherein the video frame extraction algorithm comprises a content-
2 based method of video frame extraction.

1 29. The method of claim 28, wherein the content-based method includes a keyframe scene
2 detection method selected from the group consisting of a Method One keyframe scene detection
3 method, a Method Two keyframe scene detection method, a Method Three keyframe scene
4 detection method, and a Method Four keyframe scene detection method.

5 30. The method of claim 1, wherein the video frame extraction algorithm comprises a content-
6 independent method of video frame extraction.

1 31. A system for processing video frames, comprising:

2 a video frame extraction algorithm that dynamically and non-contiguously extracts key
3 frames from the video source frames during execution of the video source frames;

4 a processor that executes the video source frames and executes the video frame extraction
5 algorithm;

6 a video input device that receives the video source frames from a video source, wherein
7 the video input device is coupled to the processor;

8 a memory structure coupled to the processor, wherein the memory structure stores the
9 video frame extraction algorithm, and wherein a first memory of the memory structure stores the
10 extracted key frames; and

11 a terminating mechanism that terminates extraction of the key frames prior to completion
12 of execution of the video source frames.

13 32. The system of claim 31, wherein the first memory includes a temporary memory.

1 33. The system of claim 32, wherein the temporary memory includes a random access memory
2 (RAM).

1 34. The system of claim 31, wherein the first memory includes a permanent memory.

1 35. The system of claim 34, wherein the permanent memory includes hard disk memory.

1 36. The system of claim 31, further comprising a recording mechanism that records in the first
2 memory an indication of a video source frame being executed when the extraction of key frames
3 is terminated.

1 37. The system of claim 36, wherein the recording mechanism records the indication in a special
2 key frame that is appended to the extracted key frames.

1 38. The system of claim 31, wherein the terminating mechanism includes a user-controlled
2 device.

1 39. The system of claim 38, wherein the user-controlled device includes a user input device that
2 is coupled to the processor.

1 40. The system of claim 31, wherein the terminating mechanism terminates the extracting at a
2 time when a predetermined condition has occurred.

1 41. The system of claim 40, wherein the predetermined condition includes execution of a
2 predetermined fraction or percentage of the video source frames.

1 42. The system of claim 40, wherein the predetermined condition includes execution of a
2 predetermined number of video source frames.

1 43. The system of claim 40, wherein the predetermined condition includes an elapsing of
2 predetermined time duration from initiation of the execution of the video source frames.

1 44. The system of claim 31, further comprising an output display through which a user may
2 review the extracted key frames, wherein the output display is coupled to the processor.

1 45. The system of claim 44, wherein the output display includes a television screen or a
2 computer monitor.

1 46. The system of claim 44, wherein the system permits review of the key frames prior to
2 completion of execution of the video source frames.

1 47. The system of claim 46, wherein the system permits review of the key frames when or after
2 the terminating mechanism terminates extracting the key frames.

1 48. The system of claim 46, wherein the system permits review of the key frames before the
2 terminating mechanism terminates extracting the key frames.

1 49. The system of claim 44, wherein the system permits review of the key frames upon or after
2 completion of execution of the video source frames.

1 50. The system of claim 44, further comprising an erasing mechanism that erases the key frames

2 from the first memory at or after completion of review of the key frames by the user.

1 51. The system of claim 50, wherein the erasing mechanism is triggered by action of the user.

1 52. The system of claim 51, further comprising a user input device, wherein the action includes
2 the user manipulation of the user input device.

1 53. The system of claim 50, wherein the erasing mechanism is triggered when a predetermined
2 condition has occurred.

1 54. The system of claim 53, wherein the predetermined condition includes completion of
2 execution of the video source frames.

1 55. The system of claim 53, wherein the predetermined condition includes an elapse of a
2 predetermined amount of time following the review of the key frames.

1 56. The system of claim 31, further comprising a second memory of the memory structure and a
2 transferring mechanism, wherein the transferring mechanism transfers the key frames from the
3 first memory to the second memory, and wherein the second memory includes a removable
4 memory.

1 57. The system of claim 56, further comprising an erasing mechanism that erases the key frames

2 from the first memory after the transferring mechanism completes transfer of the key frames
3 from the first memory to the second memory.

1 58. The system of claim 31, wherein the video frame extraction algorithm comprises a content-
2 based method of video frame extraction.

1 59. The system of claim 58, wherein the content-based method includes a keyframe scene
2 detection method selected from the group consisting of a Method One keyframe scene detection
3 method, a Method Two keyframe scene detection method, a Method Three keyframe scene
4 detection method, and a Method Four keyframe scene detection method.

1 60. The system of claim 31, wherein the video frame extraction algorithm comprises a content-
2 independent method of video frame extraction.